1. Name of Experiment/Project/Collaboration:
   CERN prototype and beam test/ LBNX
2. Physics Goals
   a. Primary: calibrate single-phase LAr detector in charged particle beam and measure systematic uncertainties
   b. Secondary: perform event reconstruction on experimental data and evaluate accuracy of LAr detector Monte Carlo; study detector performance and design
3. Expected location of the experiment/project: CERN EHN1
4. Neutrino source: none; charged particles from beam
5. Primary detector technology: single phase LAr TPC and photon detectors
6. Short description of the detector:
   - Multiple full scale TPC modules of LBNE style design (wrapped wires) to be installed in corrugated membrane cryostat.
   - Cryostat will have beam window to inject charged particles of various types in the energy range from 0.2 GeV to several GeV

7. List key publications and/or archive entries describing the project/experiment.
   Detector represents a full scale prototype detector for a single phase LAr of LBNE style. No documents exist as of yet but LBNE detector is described in arXiv: 1307.7335 .

8. Collaboration
   a. Institution list
      Author list of the EOI to CERN SPSC is attached
   b. Number of present collaborators
      No. of EOI authors: 186
   c. Number of collaborators needed.
      More collaborators are welcome.
9. R&D
   a. List the topics that will be investigated and that have been completed
   - Study single-phase LAr detector in response to charged particle beam with energies relevant for long-baseline neutrino physics and atmospheric neutrino physics.
   - Study performance of full scale detector components for future lonb-baseline neutrino physics using single phase LAr technology.

   b. Which of these are crucial to the experiment.
      All immediately apply to the LBNX experiment as this serves as a prototype detector.
   c. Time line
      - June 2015: Submit technical proposal to CERN SPSC:
      - Now – 2016: engineer, build and test components
      - Q1 – Q2, 2017: ship components to CERN, install and commission
      - Q3 2017 – Q1 2018: beam data runs
   d. Benefit to future projects

Serves as full scale prototype of LBNE style single phase LAr detector.

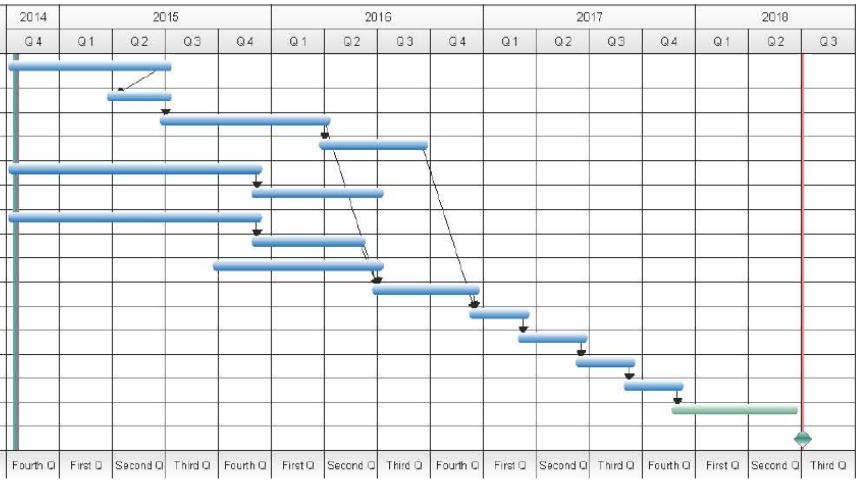
10. Primary physics goal expected results/sensitivity:

    This prototype serves to study detector physics and to verify the accuracy of Monte Carlo simulations of detector processes.

    a. For exclusion limit (such as sterile neutrino search), show 3-sigma and 5-sigma limits
    b. For discovery potential (such as the Mass Hierarchy), show 3-sigma and 5-sigma.
    c. For sensitivity plots, show 3-sigma and 5-sigma sensitivities
       (note that for neutrino-less double beta decay experiments that have previously been asked for 90% CL and 5 sigma limits these are OK)
    d. List the sources of systematic uncertainties included in the above, their magnitudes and the basis for these estimates.
    e. List other experiments that have similar physics goals
       Charged particle test beam: LArIAT phase I (and II)
    f. Synergies with other experiments.
       Allows direct and quantitative comparison with WA105 dual phase LAr detector measurements in same/similar beam tests and thereby will help to identify most advantageous far detector design for LBNX.

11. Secondary Physics Goal
    a. Expected results/sensitivity
    b. List other experiments that have similar physics goals
12. Experimental requirements
    a. Provide requirements (neutrino source, intensity, running time, location, space,…) for each physics goal
       - muon, electron, and hadron beam from 0.2 GeV to several GeV with well known particle type and momentum (e.g. at the few percent level or better)
13. Expected Experiment/Project time line
    a. Design and development
    b. Construction and Installation
    c. First data
    d. End of data taking
    e. Final results

	Activity Name	Duration (Days)	Start Date	Finish Date
1	Design Anode Plane Assembly (APA)	187.00	10/13/14	6/30/15
2	Prototype APA Frame	65.00	4/1/15	6/30/15
3	Build + Test APA 1	197.00	7/1/15	3/31/16
4	Build + Test APA 2	120.00	4/1/16	9/15/16
5	CPA Field-Cage design	300.00	10/13/14	12/4/15
6	CPA Field-Cage Construction	149.00	12/7/15	6/30/16
7	Develop Photon Detectors	300.00	10/13/14	12/4/15
8	Build Photon Detectors	127.00	12/7/15	5/31/16
9	Build Electronics	196.00	10/1/15	6/30/16
10	Local Test Installations	120.00	7/1/16	12/15/16
11	Ship to CERN	60.00	12/16/16	3/9/17
12	Install at CERN	70.00	3/10/17	6/15/17
13	Commission	60.00	6/16/17	9/7/17
14	Data Run 1	60.00	9/8/17	11/30/17
15	Contingency	140.00	12/1/17	6/14/18
16	Start Long Shutdown 2	0.00	7/2/18	7/2/18



Likely further data runs are anticipated after the CERN long shutdown. A measurement program is being developed.

14. Estimated cost range
    a. US contribution to the experiment/project
       Project funds $10 – 15 M
    b. International contribution to the experiment/project
       TBD
    c. Operations cost
       TBD

15. The Future
    a. Possible detector upgrades and their motivation.
    b. Potential avenues this project could open up.
       Detailed studies of single phase LAr detector performance in well controlled environment.